REMARKS

Claims 72-79, 81-91, and 93 are currently pending. Reconsideration of the April 11, 2006 Office Action is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 72, 78, 79, 81, and 83 have been rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Collins, Kenneth S. et al. (US 5,556,501).

In rejecting claim 72, the Office has stated:

> Collins teaches: An inductively coupled plasma CVD processing system...comprising:...a planar dielectric window (46-48; Figure 1; column 15; lines 17-30) forming a top wall (walls enclosing 16A; Figure 1) of the processing chamber (11; Figure 1; column 7; line 41); a substantially planar electrically-conductive coil (30,; Figure 1; column 8; lines 4-14) which inductively couples RF energy into the plasma processing chamber...a plurality of injector tubes (54; Figure 1; column 9; line 64 – column 10, lines 63)...."

Applicants respectfully disagree at least because the Collins et al. patent fails to disclose (1) a planar dielectric window, (2) a substantially planar coil and (3) a plurality of injector tubes.

Claim 72 recites a "planar dielectric window forming a top wall of the plasma processing chamber." The Collins et al. patent discloses a system that includes a cover (17T) made from aluminum or anodized aluminum, silicon, or silicon containing material (col. 7, l. 35-38). As such, Collins et al. fail to teach "a planar dielectric window forming a top wall of the plasma processing chamber" as recited in claim 72. Claim 72 also recites "a substantially **planar** electrically-conductive coil" and "a plurality of injector **tubes** adapted to introduce process gas into the processing

chamber" (emphasis added). The Collins et al. system does not disclose or suggest these features.

Particularly, the exemplary embodiment of the CVD processing system shown in FIG. 4 of the present application includes an antenna 150 in the form of a planar coil and a plurality of injector tubes 180, where the antenna 150 is situated in a horizontal plane. See page 11, lines 13-14, describing the coil 150 shown in FIG. 4 as a "planar multiple coil" and page 14, line 14, describing the injector 180 as "injector extension tube."

Collins et al. fail to teach a CVD processing system including "a **substantially planar** electrically-conductive coil which inductively couples RF energy into the plasma processing chamber and energies the process gas into a plasma state" and "a plurality of injector **tubes** adapted to introduce process gas into the processing chamber..." (emphasis added), as recited in claim 72. As shown in FIG. 1 of the Collins et al. patent, the CVD system includes an antenna 30 in the form of a "cylindrical" coil (col. 8, l. 4-14) and stepped sintered ceramic porous gas diffuser plugs 54 (col. 10, l. 9-11). The "diffuser plugs" are not "tubes" and the "cylindrical" coil is not a substantially planar coil.

Accordingly, Applicants respectfully submit that claim 72 is not anticipated by Collins et al., and claim 72 is allowable. Claims 78, 79, 81, and 83 depend from claim 72, rendering them also patentable for at least the same reasons.

Claim Rejections – 35 U.S.C. §103(a)

Claims 73-77 and 82 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Collins et al. in view of Latz, Rudolf et al. (US 5,169,509A).

Claims 73-74, 76-77, and 82 depend directly or ultimately from claim 72. Claim 72 recites an inductively coupled plasma CVD processing system comprising, *inter alia*, the features of "a planar dielectric window", "a substantially planar electrically-conductive coil" and "injector tubes." Claim 75 includes the same recitation. As discussed above, Collins et al. fail to teach "a planar dielectric window", "a substantially planar electrically-conductive coil" or "injector tubes." A review of Latz reveals that there is no discussion in Latz of "injector tubes" and rather than injector tubes, the drawing of Latz may depict an annular slit of gas line 24, 24a which directs gas into slot 6. The Official Action has not identified any teaching in the cited references that would have motivated a skilled artisan to combine the teachings of the cited references to arrive at Applicant's invention. As the cited references, taken individually or in combination, do not teach or suggest all of the limitations of the claimed invention, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and claims 73-77 and 82 are allowable.

Moreover, claims 73-77 and 82 recite additional combinations of features that further distinguish the claimed system over the cited references. For example, claims 73 and 74 recite the features of "the injector tubes are oriented in the plasma processing chamber to direct the process gas along axes thereof that intersect an exposed surface of the substrate at an acute angle when the substrate is supported

on the substrate support." As shown in FIG. 5, an exemplary injector tube 180A includes an axis B intersecting the exposed upper surface of the substrate (wafer 120A) at an acute angle. See also FIG. 4 showing a wafer 120 supported on a substrate support 130 and injector tubes 180 each including an axis intersecting the exposed upper surface of the substrate 120 at an acute angle. In contrast, Latz's process gas distributing lines 24, 24a direct gas upwardly away from the wafer 1.

Claim 84 has been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Collins et al. in view of Chen, Aihua (US Patent 5,691,876).

Claim 84 depends from claim 72. Claim 72 recites an inductively coupled plasma CVD processing system comprising, *inter alia*, the features of "a planar dielectric window", "a substantially planar electrically-conductive coil" and "injector tubes." As discussed above, Collins et al. fail to teach "a planar dielectric window", "a substantially planar electrically-conductive coil" and "injector tubes." A review of Chen reveals that Chen is silent on each of these features. The Official Action has not identified any teaching in the cited references that would have motivated a skilled artisan to combine the teachings of the cited references to arrive at Applicant's invention. As the cited references, taken individually or in combination, do not teach or suggest all of the limitations of the claimed invention, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and claim 84 is allowable.

Claims 85-91 and 93 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Collins et al. in view of Chen, Aihua (US Patent 5,691,876) and Latz, Rudolf et al. (US 5,169,509A).

Claim 85 is directed to an inductively coupled plasma CVD processing system comprising, *inter alia*, the features of "a planar dielectric window", "a substantially planar electrically-conductive coil" and "injector tubes." As discussed above, Collins et al. fail to teach each of these features and on page 10 of the Official Action acknowledges "Collins does not teach . . . a planar dielectric window . . . a substantially planar electrically conductive coil . . . and a plurality of injector tubes . . ." (Official Action at page 10, lines 4-15). The Official Action has not identified any teaching in the cited references that would have motivated a skilled artisan to combine the teachings of the cited references to arrive at Applicant's invention. As the cited references, taken individually or in combination, do not teach or suggest all of the limitations of the claimed invention, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and claim 85 is allowable. Claims 86-89 and 93 depend from claim 85, rendering them also patentable for at least the same reasons.

In the Official Action, Chen is cited for disclosure of a substrate support which heats a substrate and thus fails to cure the previously noted deficiencies of Collins. Latz is cited for disclosure of injector tubes but as pointed out above, Latz does not include any discussion of "injector tubes". As such, Latz fails to cure the previously noted deficiencies of Collins.

Moreover, claims 86-89 and 93 recite additional combinations of features that further distinguish the claimed system over the cited references. For example, claim 89 recites the features of "the injector tubes are oriented in the plasma processing chamber to direct the process gas along axes thereof that intersect the exposed

surface of the substrate at an acute angle when the substrate is supported on the substrate support." As shown in FIG. 5, an exemplary injector tube 180A includes an axis B intersecting the exposed upper surface of the substrate (wafer 120A) at an acute angle. See also FIG. 4 showing a wafer 120 supported on a substrate support 130 and injector tubes 180 each including an axis intersecting the exposed upper surface of the substrate 120 at an acute angle. In contrast, Latz's process gas distributing lines 24, 24a inject gas upwardly away from the wafer 1.

Conclusion

Based on the reasons as set forth above, Applicants respectfully request allowance of all pending claims.

In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicants' undersigned representative so that prosecution of the application may be expedited.

Respectfully submitted,

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